

Claims

1. A pre-diffuser for a gas turbine engine, for location between a compressor and a combustor of the engine to  
5 receive air flowing therebetween, the pre-diffuser being generally annular, including radially inner and radially outer walls and a generally cylindrical midline defined between the walls, wherein the pre-diffuser is shaped to include a first upstream portion in which air flowing  
10 through the pre-diffuser is directed away from the midline and a second downstream portion in which air flowing through the pre-diffuser is directed at least partially towards the midline of the pre-diffuser.
2. A pre-diffuser according to claim 1, including a  
15 generally annular central member located between the radially inner and radially outer walls, airflow through the pre-diffuser being forced to separate and pass around the central member.
3. A pre-diffuser according to claim 2, wherein the  
20 central member includes an upstream portion which includes radially outer and radially inner walls, each diverging away from the midline of the pre-diffuser in the downstream direction, causing air flowing around the upstream portion of the central member to be directed away from the midline  
25 of the pre-diffuser.
4. A pre-diffuser according to claim 3, wherein the walls are angled at between  $20^{\circ}$  and  $90^{\circ}$  to one another.
5. A pre-diffuser according to claim 3 or claim 4,  
30 wherein a pathway for air is defined between the radially outer wall of the diffuser and the radially outer wall of the upstream portion of the central member, the respective radially outer walls converging in the downstream direction, for accelerating air flowing therebetween.
6. A pre-diffuser according to any of claims 3 to 5,  
35 wherein a pathway for air is defined between the radially inner wall of the pre-diffuser and the radially inner wall

of upstream portion of the central member, the respective radially inner walls converging in the downstream direction, for accelerating air flowing therebetween.

7. A pre-diffuser according any of claims 3 to 6, wherein  
5 the central member further includes a downstream portion including radially outer and radially inner walls, each converging towards the midline of the pre-diffuser in the downstream direction, allowing air flowing therearound to diffuse towards the midline of the pre-diffuser.

10 8. A pre-diffuser according to claim 7, wherein the walls are angled at between  $10^{\circ}$  to  $40^{\circ}$  to one another.

9. A pre-diffuser according to claim 7 or claim 8, wherein a pathway for air is defined between the radially outer wall of the pre-diffuser and the radially outer wall  
15 of the downstream portion of the central member, the respective walls of the pre-diffuser and the central member diverging in the downstream direction, for diffusing air flowing therebetween.

10. A pre-diffuser according to any of claims 7 to 9,  
20 wherein a pathway for air is defined between the radially inner wall of the pre-diffuser and the radially inner wall of the downstream portion of the central member, the respective walls of the pre-diffuser and the central member diverging in the downstream direction, for diffusing air  
25 flowing therebetween.

11. A pre-diffuser according to any of claims 8 to 10, wherein the radially inner and outer walls of the pre-diffuser diverge at a lesser angle than do the radially inner and outer walls of the upstream part of the central  
30 member.

12. A gas turbine engine including a pre-diffuser according to any preceding claim, the gas turbine engine including a generally annular combustor.

13. A gas turbine engine according to claim 12, wherein  
35 the combustor is surrounded by radially inner and radially outer annuli each receiving air flowing from the pre-

diffuser, and wherein the pre-diffuser and combustor are shaped such that less than 20% of the air exiting the pre-diffuser is directed down each of the radially inner and radially outer annuli.

5 14. A pre-diffuser substantially as herein described with reference to Figs. 3 and 4 of the drawings.

15. Any novel subject matter or combination including novel subject matter disclosed herein, whether or not within the scope of or relating to the same invention as  
10 any of the preceding claims.